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Title: COMPOUNDS AND METHODS FOR PHARMICO-GENE THERAPY OF EPITHELIAL SODIUM CHANNEL ASSOCIATED

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**DISORDERS** 

## IN THE CLAIMS

Please amend the claims as follows:

- 1. (Currently Amended) A method to identify one or more agents with dual therapeutic activity, comprising:
  - a) selecting one or more agents which inhibit or treat one or more symptoms of a disease which is associated with aberrant expression or activity of amiloride-sensitive epithelial sodium channels (ENaC) having  $\alpha$ ,  $\beta$  and  $\gamma$  subunits of ENaC;
  - contacting *in vitro* mammalian cells with the one or more agents and a <u>viral</u> gene b) therapy vector; and
  - identifying an agent from those contacted with the mammalian cells that enhances c) the transduction efficacy of the viral gene therapy vector relative to mammalian cells contacted with the <u>viral</u> gene therapy vector but not contacted with the one or more agents.
- 2. (Currently Amended) A method to identify one or more agents with dual therapeutic activity, comprising:
  - a) selecting one or more agents that enhance the transduction efficacy of a viral gene therapy vector in mammalian cells;
  - contacting *in vitro* mammalian cells having aberrant expression or activity of b) <u>amiloride-sensitive</u> epithelial sodium channels (ENaC) <u>having</u>  $\alpha$ ,  $\beta$  and  $\gamma$  subunits of ENaC with the one or more agents; and
  - c) identifying an agent from those contacted with the mammalian cells that alters ENaC expression or activity.
- 3. (Canceled)
- 4. (Currently Amended) The method of claim 1 or 2 [[3]] wherein the viral vector is a retroviral vector, a lentiviral vector, an adenoviral vector of an adeno-associated viral vector.

- 5. (Original) The method of claim 1 wherein the gene therapy vector comprises a marker gene.
- 6. (Original) The method of claim 2 wherein the mammalian cells do not express functional CFTR.
- 7. (Original) The method of claim 2 wherein the selected agent is effective to decrease the level or amount of transcription of one or more subunits of ENaC.
- 8. (Withdrawn) The method of claim 2 wherein the selected agent is effective to decrease the level or amount of transcription of the  $\alpha$ ,  $\beta$  and  $\gamma$  subunits of ENaC.
- 9. (Withdrawn) The method of claim 2 wherein the selected agent is effective to alter ENaC activity.
- 10. (Withdrawn) A method to identify one or more agents that decrease the level or amount of transcription of one or more subunits of epithelial sodium channels (ENaC) in mammalian cells, comprising:
  - a) contacting mammalian cells which express ENaC with at least one agent that is a proteasome modulating agent, wherein the agent is not a gene or gene product encoded by the genome of the cells, the complement of the gene, or a portion of the gene or its complement; and
  - b) identifying whether an agent decreases the level or amount of transcription from one or more subunits of ENaC in the mammalian cells.
- 11. (Withdrawn) A method to identify one or more agents that decrease the level or amount of transcription from the  $\alpha$ ,  $\beta$ , and  $\gamma$  subunits of ENaC in mammalian cells, comprising:
  - a) contacting mammalian cells which express ENaC with at least one agent; and

b) identifying whether an agent decreases the level or amount of transcription from the  $\alpha$ ,  $\beta$ , and  $\gamma$  subunits of ENaC in the mammalian cells.

- 12. (Withdrawn) A method to identify one or more agents that decrease the level or amount of transcription of one or more subunits of ENaC in mammalian cells, comprising:
  - a) contacting mammalian cells which express ENaC with at least one agent that enhances viral transduction; and
  - b) identifying whether an agent decreases the level or amount of transcription from one or more subunits of ENaC in the mammalian cells.
- 13. (Currently Amended) The method of any one of claims 1 to 2 or 10 to 12 wherein the cells are mammalian lung or kidney cells.
- 14. (Withdrawn) The method of claim 11 or 12 wherein the one agent is not a gene or gene product encoded by the genome of the cells, the complement of the gene, or a portion of the gene or its complement cells are mammalian kidney cells.
- 15. (Currently Amended) The method of any one of claims 1 to 2 or 10 to 12 wherein the cells are human cells, canine cells, murine cells, rat cells or rabbit cells.
- 16. (Currently Amended) The method of any one of claims 1 to 2 or 10 to 12 wherein one of the agents is an antibiotic.
- 17. (Withdrawn) The method of any one of claims 1 to 2 or 10 to 12 wherein one of the agents is a chemotherapeutic.
- 18. (Withdrawn) The method of any one of claims 1 to 2 or 10 to 12 wherein one of the agents is a lipid lowering agent.

- 19. (Withdrawn) The method of any one of claims 1 to 2 or 10 to 12 wherein one of the agents is a food additive.
- 20. (Currently Amended) The method of any one of claims 1 to 2 or 10 to 12 wherein one of the agents is epoxomicin, doxorubicin, DOXIL® [[doxil]], daunorubicin, idarubicin, epirubicin, aclarubicin, camptothecin, simvastatin, tannic acid, or cisplatin.
- 21. (Withdrawn) The method of any one of claims 1 to 2 or 10 to 12 wherein one of the agents modulates subcellular localization of proteasomes.
- 22. (Withdrawn) The method of any one of claims 1 to 2 or 10 to 12 wherein the agent does not alter post-translational processing of ENaC.
- 23. (Currently Amended) The method of any one of claims 1 to 2 or 10 to 12 wherein one of the agents modulates transcription of one or more molecules that regulate ENaC transcription.
- 24. (Withdrawn) The method of any one of claims 10 to 12 wherein the amount of agent decreases the level or amount of transcription for greater than one week.
- 25. (Withdrawn) The method of any one of claims 10 to 12 wherein the amount of agent decreases the level or amount of transcription for at least one day.
- 26. (Withdrawn) The method of any one of claims 10 to 12 wherein the amount of agent decreases the level or amount of transcription for at least 3 days.
- 27. (Withdrawn) The method of any one of claims 10 to 12 wherein the amount of agent decreases the level or amount of transcription for greater than two weeks.

- 28. (Withdrawn) The method of any one of claims 1 to 2 or 10 to 12 wherein one of the agents modulates transport of molecules to or from the nucleus.
- 29. (Withdrawn) The method of any one of claims 1 to 2 or 10 to 12 wherein one of the agents is an endosomal protease inhibitor.
- 30. (Withdrawn) The method of any one of claims 1 to 2 or 10 to 12 wherein one of the agents is a cysteine protease inhibitor.
- 31. (Withdrawn) The method of any one of claims 1 to 2 or 10 to 12 wherein one of the agents is not TPA.
- 32. (Withdrawn) The method of any one of claims 1 to 2 or 10 to 12 wherein one of the agents alters endosomal processing.
- 33. (Withdrawn) A method to inhibit or treat a condition associated with increased ENaC levels or increased ENaC activity, comprising: contacting a mammal at risk of or having the condition with an effective amount of an agent that inhibits or decreases transcription of one or more ENaC subunit genes and/or alters the level, amount or activity of a molecule that alters transcription of one or more ENaC subunit genes, and enhances the efficacy of gene therapy vectors.
- 34. (Withdrawn) A method to inhibit or treat a condition associated with increased ENaC levels or increased ENaC activity, comprising: contacting a mammal at risk of or having the condition with an effective amount of an agent that inhibits or decreases transcription of one or more ENaC subunit genes and/or alters the level, amount or activity of a molecule that alters transcription of one or more ENaC subunit genes, wherein the agent is a proteasome modulating agent, and wherein the agent is not a gene or gene product encoded by the genome of the mammal, the complement of the gene, or a portion of the gene or its complement.

35. (Withdrawn) A method to inhibit or treat a condition associated with increased ENaC levels or increased ENaC activity, comprising: contacting a mammal at risk of or having the condition with an effective amount of an agent that inhibits or decreases transcription of the  $\alpha$ ,  $\beta$ , and  $\gamma$  subunits of ENaC or alters the level, amount or activity of a molecule that alters transcription of the  $\alpha$ ,  $\beta$ , and  $\gamma$  subunits of ENaC.

- 36. (Withdrawn) A method to inhibit or treat a condition associated with increased ENaC levels or increased ENaC activity, comprising: contacting a mammal at risk of or having the condition with an effective amount of an agent that inhibits or decreases transcription of one or more ENaC subunit genes and/or alters the level, amount or activity of a molecule that alters transcription of one or more ENaC subunit genes, and enhances transduction of viruses which infect mammalian cells.
- 37. (Withdrawn) The method of any one of claims 33 to 36 wherein the agent is epoxomicin, doxorubicin, doxil, daunorubicin, epirubicin, idarubicin, aclarubicin camptothecin, simvastatin, tannic acid or cisplatin.
- 38. (Withdrawn) The method of any one of claims 33 to 36 wherein the agent is a chemotherapeutic.
- 39. (Withdrawn) The method of any one of claims 33 to 36 wherein the agent is an antibiotic.
- 40. (Withdrawn) The method of any one of claims 33 to 36 wherein the agent is a food additive.
- 41. (Withdrawn) The method of any one of claims 33 to 36 wherein the agent is a lipid lowering agent.

- 42. (Withdrawn) The method of any one of claims 33 to 36 wherein the agent does not alter post-translational processing of ENaC.
- 43. (Withdrawn) The method of any one of claims 33 to 36 wherein the agent is not TPA.
- 44. (Withdrawn) The method of any one of claims 33 to 36 wherein the agent modulates transcription of one or more molecules that modulate ENaC transcription.
- 45. (Withdrawn) The method of any one of claims 33 to 36 wherein the agent modulates transport of molecules to or from the nucleus.
- 46. (Withdrawn) The method of any one of claims 33 to 36 wherein the agent modulates subcellular localization of proteasomes.
- 47. (Withdrawn) The method of any one of claims 33 to 36 wherein the agent decreases the level of ENaC transcription by at least 2 fold relative to a corresponding mammal not contacted with the agent.
- 48. (Withdrawn) The method of any one of claims 33 to 36 wherein the agent decreases the level of ENaC transcription by at least 3 fold relative to a corresponding mammal not contacted with the agent.
- 49. (Withdrawn) The method of any one of claims 33 to 36 wherein the agent decreases the level of ENaC transcription by at least 10 fold relative to a corresponding mammal not contacted with the agent.
- 50. (Withdrawn) The method of any one of claims 33 to 36 further comprising contacting the mammal with a recombinant virus.

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- 51. (Withdrawn) The method of any one of claims 33 to 36 wherein the agent is contacted with the respiratory tract of the mammal.
- 52. (Withdrawn) The method of any one of claims 33 to 36 wherein the agent enhances the efficacy or transduction of adenovirus, retrovirus, adeno-associated virus or lentivirus vectors.
- 53. (Withdrawn) The method of claim 33, 35 or 36 wherein the one agent is not a gene or gene product encoded by the genome of the cells, the complement of the gene, or a portion of the gene or its complement cells are mammalian kidney cells.